



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/806,314 | 03/23/2004 | Stefan Kading | 033171-2 | 1758 |

25570 7590 10/26/2007
ROBERTS, MLOTKOWSKI & HOBBS
P. O. BOX 10064
MCLEAN, VA 22102-8064

| |
|----------|
| EXAMINER |
|----------|

OLSEN, KAJ K

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1795

| | |
|-------------------|---------------|
| NOTIFICATION DATE | DELIVERY MODE |
|-------------------|---------------|

10/26/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Dbeltran@rmhlaw.com
LGaughan@rmhlaw.com

Office Action Summary

Application No.

10/806,314

Applicant(s)

KADING, STEFAN

Examiner

Kaj K. Olsen

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3-23-04.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 6-13, 15, 20, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Gür et al (USP 5,827,415).
3. Gür disclose a gas sensor comprising a layer structure including a reference electrode (22, 23) completely surrounding by a gastight material (21, 26) and a catalytically active working electrode 27 which is exposed to the measurement gas. See fig. 2D and 2E and col. 5, l. 20 through col. 6, l. 4. See also fig. 3 where the reference electrode is surrounded by a combination of electrolyte and substrate/support.
4. With respect to the electrolyte composition, see col. 3, l. 65 through col. 4, l. 5.
5. With respect to the use of gastight materials that are electrically insulating, the various glasses listed at col. 8, ll. 45 and 46 are electrically insulating materials. In addition, electrolyte is generally ion conductive, but is considered electrically insulating (i.e. it doesn't have appreciable electronic conductivity).
6. With respect to the use of a heating system, see fig. 4 and col. 7, ll. 1-18.
7. With respect to the reference electrode composition, it comprises both metals and metal oxides. See col. 5, ll. 42-48.

Art Unit: 1795

8. With respect to the working electrode composition, it can comprise precious metals or oxides. See col. 5, l. 67 through col. 6, l. 4.
9. With respect to operating on the potentiometric measurement principle, Gür discloses using the sensor for Nernstian measurements. See col. 3, ll. 10-24. Nernst measurements are potentiometric measurements.
10. With respect to the specified λ values, because Gür discloses all the structural limitations of the claims, then it presumably also possesses the capability of measuring the various λ values.
11. With respect to the process claims (those limitations not covered above), Gür discloses providing a carrier layer 31 of insulating material, forming a reference electrode 33 on the carrier layer, covering the reference electrode with a gastight solid electrolyte layer 34, and forming a working electrode 36 on the gastight solid electrolyte layer. See fig. 3 and col. 6, ll. 19-67.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gür in view of Sridharan et al (USP 6,124,224).
14. Gür set forth all the limitations of the claim, but did not explicitly recite the use of a low-sodium glass. Although applicant never further defines what they mean by "low sodium", the examiner will interpret this as meaning the use of a glass containing no or little sodium within it.

Art Unit: 1795

Sridharan teaches the use of a glass for sealing various sensor components. This glass contains little or no sodium, provides a high resistivity at high temperatures, and has a thermal expansion coefficient comparable to that of the other sensor components like the electrolyte or other ceramic substrates. See col. 3, ll. 20-42. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the glass composition of Sridharan for the glass sealing material of Gür in order to provide a glass having high resistivity and a thermal expansion coefficient comparable to the other sensor components.

15. Claims 14, 16, 17, 19, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gür in view of Omara et al (USP 6,153,071).

16. As discussed for claim 15 above, Gür already disclosed a process for producing a sensor element having a combination of a carrier layer, a solid electrolyte, a reference electrode, and a gastight cover layer. See fig. 2 and 3 and the discussion above. However, Gür did not assemble its sensor components in the manner recited by claim 14. Claim 15 appears to read on the assembly for fig. 2 of the instant invention where the reference electrode is between the carrier layer and the solid electrolyte layer, which Gür taught (compare fig. 3 of Gür with fig. 2 of the instant invention). Claim 14 by contrast appears to read on fig. 1 where the sealed reference electrode 10 is placed on the same surface as the working electrode. However, Omara teaches that one can either place the potentiometric electrodes for the sensor on opposite sides of the electrodes (compare fig. 4 of Omara with fig. 2 and 3 of Gür) or on the same side of the electrolyte (see fig. 5 of Omara). See also col. 5, ll. 31-56. In the embodiment of fig. 5 of Omara, the electrolyte layer 214 would be placed over the carrier layer 260 followed by the forming of the two electrodes (216, 218) followed by the forming of any covering layers (220,

221) over the electrode or electrodes. Because Omara teaches that one electrode of the potentiometric sensor can be placed either opposite or adjacent the other electrode without any change in essential operation, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to substitute the reference electrode location of Gür for another to achieve the predictable result of providing a functioning sensor. In fact, because Gür teaches that the reference electrode is sealed away from any gas exposure (col. 6, ll. 55 and 56), there is no criticality on where it is located on the solid electrolyte and the alternate arrangement of Omara would have provided the same predictable result. Furthermore, Omara teaches that the arrangement of fig. 5 has an advantage over the arrangement of fig. 4 in that both electrodes are separated from the heating element. In fig. 4 of Gür, the reference electrode is closer to the heating element than the working electrode. Utilizing the structure of fig. 5 from Omara would result in both of the electrode being the same distance away from the heater, thereby less subject to thermal gradients.

17. With respect to the various dependent claims, see the discussion of Gür above.
18. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gür in view of Omara as applied to claim 14 above, and further in view of Sridharan.
19. This claim is rejected over the further teaching of Sridharan for the same reasons as discussed for claim 5 above.

Art Unit: 1795

Conclusion


20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Other references that teach the use of a sealed reference electrode include Otsuka et al (USP 4,278,509), Isenberg (USP 3,915,830), and Aldinger et al (USP 5,308,469).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1795
October 18, 2007


KAJ K. OLSEN
PRIMARY EXAMINER